

QUEENSLAND'S RAINFOREST CANOPIES - A MITEY CORNUCOPIA

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Recent research, relying on the rain of arthropods that falls after the application of a chemical fog or spray, has clearly demonstrated that insects are abundant and diverse in the canopies of Australian rainforests (Bassett 1991; Kitching *et al.* 1993). Although estimates of insect species number may have been too enthusiastic (Monteith 1990), actual arthropod diversity and abundance are grossly underestimated by these chemical knockdown techniques because of their strong bias against small arthropods, especially mites (Walter *et al.* 1994). Like the soil beneath the canopy, rainforest trees themselves are infused with a terrestrial plankton, composed primarily of minute, scurrying, eight-legged arthropods.

To demonstrate this, I obtained estimates of the number of mites inhabiting the leaves of rainforest trees. Extendable pole-pruners were used to clip leaves from the canopies of a scentless rosewood and a native gardenia adjacent to Mick's Tower, O'Reilly's Rainforest Retreat, Lamington National Park (one of the sites reported in Kitching *et al.* 1993) on 10.iii.1993, and to clip the large, compound leaves of a brown tamarind at the CSIRO forestry research tower at Curtain Fig near Atherton on 24.iv.1993. Leaves were placed in plastic bags and chilled until mites could be counted and collected using a fibre optic-illuminated stereomicroscope. I also counted the number of leaves per branch on a sample of branches, and the number of branches per tree on each of these, relatively small, rainforest trees. The mean number of leaves per branch (rounded down) times the number of branches gave conservative estimates of the number of leaves per tree (Table 1).

Table 1. Estimates of the number of mites inhabiting leaves of some rainforest trees in Queensland. Only estimates of mites living on leaves are given.

Site	Tree Species	Height	Leaves/Tree	Mites/Leaf	Mites/Tree
Curtain Fig	<i>Diploglottis diphylostegia</i>	26 m	4,000	95.4 ± 12.2 (n = 15)	381,600
O'Reilly's	<i>Synoum glandulosum</i>	12 m	16,500	28.3 ± 2.8 (n = 45)	466,950
O'Reilly's	<i>Randia benthamiana</i>	10 m	34,000	10.92 ± 1.3 (n = 50)	371,280

Rather than being relatively rare (Kitching *et al.* 1993) or absent (Basset 1991), as implied by previous studies, Australian rainforest canopies are covered in mites, numerous species and uncountable numbers (Table 1). Many thousands of other mites live on stems and bark, in flowers and epiphytes, and as commensals and parasites on many of the insects and all of the vertebrates that also inhabit these trees. This richness of animals must have consequences for the canopy system, especially those resulting from the feeding of the predatory and scavenging-fungivore mites that made up the vast majority of the mites discovered.

References

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